PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Appeal No. _____

Application No.:	10/588,404
Conf. No.:	6947
Filing Date:	August 3, 2006
Appellants:	Masaki Kitahara et al.
Group Art Unit:	2482
Examiner:	Hee-Yong Kim
Title:	Video Encoding Method and Apparatus, Video Decoding Method and Apparatus, Programs Therefor, and Storage Media for Storing the Programs
Attorney Docket:	5259-000070/US/NP

APPEAL BRIEF

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February 6, 2012

Sir:

This brief on appeal is submitted pursuant to the Notice of Appeal filed in the U.S. Patent and Trademark Office on December 6, 2011, and in response to the Advisory Action mailed December 19, 2011, the Final Office Action mailed September 13, 2011, and the Notice of Panel Decision from Pre-Appeal Brief Review mailed March 15, 2011.

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I. REAL PARTY IN INTEREST

The real party in interest is Nippon Telegraph and Telephone Corporation by virtue of assignments recorded in the Patent and Trademark Office at Reel 018141, Frame 0541.

II. RELATED APPEALS AND INTERFERENCES

The Assignee, the Appellants, and the undersigned do not know of any other appeals, interferences, or judicial proceedings that would directly affect or that would be directly affected by, or have a bearing on, the Board's decision in this Appeal.

III. STATUS OF THE CLAIMS

Claims 1-14, 16, and 18 are pending and stand rejected.

Appellants appeal the rejection of claims 1-14, 16, and 18.

Claims 15 and 17 have been cancelled, by Amendment in Response to Non-Final Office Action dated July 21, 2010.

In the Advisory Action dated December 19, 2011, the Examiner notified Appellants that his rejection of claims 16 and 18 under 35 U.S.C. 101 had been included in the Final Office Action by mistake and that such rejection was withdrawn based on the amendments made in Appellants' prior response. The withdrawal of the 35 U.S.C. 101 rejection was confirmed by Appellants' attorney in the Amendment in Response to Final Office Action dated December 6, 2011.

IV. STATUS OF THE AMENDMENTS

Claim 1 was amended subsequent to the Final Office Action (in the amendment dated December 6, 2011) to address a rejection under 35 U.S.C. 112. As indicated in the Advisory Action mailed December 19, 2011, this amendment has not been entered.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

Concise Explanation of Independent Claim 1

Independent claim 1 recites a video encoding method that assigns a plurality of images [A, B, C in Figs. 1 and 5] to a plurality of GOPs [Fig. 1, Fig. 5] which correspond to different viewing positions or directions, and encodes images belonging to the GOPs as a video image, the method comprising:

a GOP encoding determination step in which:

if it is determined that each image belonging to a given GOP can be generated on a decoding side without using encoded data of a relevant image, it is determined that the relevant image is not encoded and no encoded data thereof is output; [see Fig. 2, dotted boxed switch preceding box 114, controlled by box 117] [see pages 14–15 (corresponding to paragraphs [0082] and [0083] in application published as US 2008/0317115)] and

if it is determined that each image belonging to the given GOP cannot be generated on a decoding side unless encoded data of the relevant image is used, then it is determined that the relevant image is encoded and the encoded data thereof is output; [see Fig. 2, dotted boxed switch preceding box 114, controlled by box 117] [see pages 14–15 (corresponding to paragraphs [0082] and [0083] in application as published)]

a GOP encoding/non-encoding data encoding step [see box 118 of Fig. 2] of encoding GOP encoding/non-encoding data for indicating whether the encoded data of the image belonging to the given GOP is output; and

an in-GOP image encoding step [see box 110 of Fig. 2], of encoding the image belonging to the given GOP when the encoded data of the image is output, wherein:

when a subject is included in said images belonging to the GOPs and it is determined that the relevant image of the given GOP is not encoded, image data of the subject having a viewing position or direction which corresponds to the given GOP is generated using data of the images belonging to the GOPs other than the given GOP. [see page 21, lines 6-10: "when no encoded data is output from the in-GOP image encoding part 110, the decoded image storage memory 112 deletes the decoded images at times T1 and T2, and stores images corresponding to the encoding data of the GOP which is determined by the GOP encoding determination part 117, among the images generated by the image generation part 114 (i.e., images generated by the selected image generation method)"]

Concise Explanation of Independent Claim 5

Independent claim 5 recites a video decoding method that decodes encoded data generated by assigning a plurality of images [A, B, C in Figs. 1 and 5] to a plurality of GOPs [Fig. 1, Fig. 5] which correspond to different viewing positions or directions, and encoding images belonging to the GOPs as a video image, the method comprising:

a GOP encoding/non-encoding data decoding step of decoding GOP encoding/non-encoding data for indicating whether the encoded data of each image belonging to a given GOP is to be decoded; and [see Fig. 3 dotted boxed switch preceding box 209, controlled by box 210] [see page 25 (corresponding to paragraphs [0140] – [0141] in application published as US 2008/0317115)]

an in-GOP image decoding step in which:

if the GOP encoding/non-encoding data indicates that the encoded data of a relevant image is to be decoded, the relevant image is decoded by decoding the encoded data; and [see Fig. 3, boxes 208, 209, see page 25 corresponding to paragraph [0142] in published application]

if the GOP encoding/non-encoding data indicates that the encoded data of the relevant image is not to be decoded, the relevant image is decoded by using an image generation method which does not use the encoded data of this image, wherein: [see Fig. 3, box 205, see page 25 corresponding to paragraph [0141] in published application]

when a subject is included in said images belonging to the GOPs and the GOP encoding/non-encoding data indicates that the encoded data of the relevant image is not to be decoded, image data of the subject having a viewing position or direction which corresponds to the given GOP is generated using data of the images belonging to the GOPs other than the given GOP. [see page 21, lines 6-10, discussed above in connection with claim 1]

Concise Explanation of Independent Claim 8

Independent claim 8 recites a video encoding apparatus that assigns a plurality of images [A, B, C in Figs 1 and 5] to a plurality of GOPs [Fig 1, Fig. 5] which correspond to different viewing positions or directions, and encodes images belonging to the GOPs as a video image, the apparatus comprising:

a GOP encoding determination part in which:

if it is determined that each image belonging to a given GOP can be generated on a decoding side without using encoded data of a relevant image, the GOP encoding determination part determines that the relevant image is not encoded and no encoded data thereof is output; and [see Fig. 2, dotted boxed switch preceding box 114, controlled by box 117] [see pages 14–15 (corresponding to paragraphs [0082] and [0083] in application published as US 2008/0317115)]

if it is determined that each image belonging to the given GOP cannot be generated on a decoding side unless encoded data of the relevant image is used, then the GOP encoding determination part determines that the relevant image is encoded and the encoded data thereof is output; [see Fig. 2, dotted boxed switch preceding box 114, controlled by box 117] [see pages 14–15 (corresponding to paragraphs [0082] and [0083] in application as published)]

a GOP encoding/non-encoding data encoding part [see box 118, Fig. 2] for encoding GOP encoding/non-encoding data for indicating whether the encoded data of the image belonging to the given GOP is output; and

an in-GOP image encoding part [see box 110, Fig. 2] for encoding the image belonging to the given GOP when the encoded data of the image is output, wherein:

when a subject is included in said images belonging to the GOPs and the GOP encoding determination part determines that the relevant image of the given GOP is not encoded, image data of the subject having a viewing position or direction which corresponds to the given GOP is generated using data of the images belonging to the GOPs other than the given GOP. [see page 21, lines 6-10, discussed above in connection with claim 1]

Concise Explanation of Independent Claim 12

Independent claim 12 recites a video decoding apparatus that decodes encoded data generated by assigning a plurality of images [A, B, C in Figs 1 and 5] to a plurality of GOPs [Fig. 1, Fig. 5] which correspond to different viewing positions or directions, and encoding images belonging to the GOPs as a video image, the apparatus comprising:

a GOP encoding/non-encoding data decoding part for decoding GOP encoding/non-encoding data for indicating whether the encoded data of each image belonging to a given GOP is to be decoded; and [see Fig. 3 dotted boxed switch preceding box 209, controlled by box 210] [see page 25 (corresponding to paragraphs [0140] – [0141] in application published as US 2008/0317115)]

an in-GOP image decoding part in which:

if the GOP encoding/non-encoding data indicates that the encoded data of a relevant image is to be decoded, the in-GOP image decoding part decodes the relevant image by decoding the encoded data; and [see Fig. 3, boxes 208, 209, see page 25 corresponding to paragraph [0142] in published application]

if the GOP encoding/non-encoding data indicates that the encoded data of the relevant image is not to be decoded, the in-GOP image decoding part decodes the relevant image by using an image generation method which does not use the encoded data of this image, wherein: [see Fig. 3, box 205, see page 25 corresponding to paragraph [0141] in published application]

when a subject is included in said images belonging to the GOPs and the GOP encoding/non-encoding data indicates that the encoded data of the relevant image is not to be decoded, image data of the subject having a viewing position or direction which corresponds to the given GOP is generated using data of the images belonging to the GOPs other than the given GOP. [see page 21, lines 6-10, discussed above in connection with claim 1]

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Appellants seek the Board's review of:

(a) whether claims 1, 3-8, 10-14, 16, and 18 are unpatentable under 35 U.S.C. § 103(a) over Kimata (CIT 2004, IEEE; "Kimata") in view of Puri (Signal Processing Image Communication 2, 1990, pp. 127-144; "Puri");

(b) whether claims 2 and 9 are unpatentable under 35 U.S.C. § 103(a) over Kimata in view of Puri, and further in view of Eifrig (U.S. Pat. No. 5,991,447; "Eifrig"); and

(c) whether claims 1-4, 8-11, 12-14 and 16 fail to comply with the first paragraph of 35 U.S.C. § 112.

Appellants note that the rejection of claims 16 and 18 under 35 U.S.C. §101 was withdrawn by the Examiner in an Advisory Action mailed December 19, 2011 and is therefore not the subject of this Appeal.

Appellants further note that the rejection of claims 1-4, 8-11, 12-14, and 16 under 35 U.S.C. §112, first paragraph, was addressed by Amendment filed December 6, 2011 which made a simple change of moving the "wherein" clause to begin on a new line at the end of the claim. The Examiner indicated in the subsequent Advisory Action mailed December 19, 2011 that the amendment would not be entered because it raised new issues that would require further consideration. A more complete discussion of this issue is presented below in Argument VII-C.

VII. ARGUMENTS

A. Rejection under 35 U.S.C. § 103(a) over Kimata (CIT 2004, IEEE; "Kimata") in view of Puri (Signal Processing Image Communication 2, 1990, pp. 127-144; "Puri")

In the interest of simplifying the arguments, Appellants argue independent claims 1, 5, 8, and 12 as a group, using claim 1 as representative for purposes of the arguments made herein.

Legal Errors Made by Examiner

In rejecting the claims under 35 U.S.C. §103, the Examiner has made several legal errors, which fall into two categories.

First, the Examiner has not properly followed the U.S. Supreme Court precedent from *Graham v. John Deere Co.* 383 U.S. 1 (1966), which requires the examiner to ascertain the differences between the prior art and the claimed invention. Even giving the claims their broadest reasonable interpretation, the Examiner failed to consider all of the claim language recited and thus reached an incorrect conclusion as to the differences between the prior art and Appellants' claimed invention.

Second, the Examiner did not follow the requirements set forth in the U.S. Supreme Court decision in *KSR International Co. v. Teleflex Inc.* 550 U.S. 398 (2007) which requires the Examiner to provide a rational underpinning as to why a skilled person would combine Kimata and Puri.

These first and second classes of errors will be separately discussed below as the "Failure to Ascertain Differences Between Prior Art and Claimed Invention" and the "Lack of Rational Underpinning."

Failure to Ascertain Differences Between Prior Art and Claimed Invention

The Kimata prior art

The Examiner admits that none of the elements of the claim are found in Kimata (with the possible ambiguous exception of the "in-GOP encoding step" which the Examiner identifies as being found in Kimata on page 6, and yet states that it is *not found* in Kimata on page 7). Whichever is the case, however, the Examiner admittedly does not find the remaining four elements of applicants' claim in the cited Kimata reference.

To illustrate, below is applicants' claim 1 which has been labeled according to the Examiner's admissions regarding applicability of Kimata. The Examiner's position is shown in [Brackets]:

1. **[Kimata discloses]** A video encoding method that assigns a plurality of images to a plurality of GOPs which correspond to different viewing positions or directions, and encodes images belonging to the GOPs as a video image, the method comprising:

[Kimata does not disclose] a GOP encoding determination step in which:

[Kimata does not disclose] if it is determined that each image belonging to a given GOP can be generated on a decoding side without using encoded data of a relevant image, it is determined that the relevant image is not encoded and no encoded data thereof is output; and

[Kimata does not disclose] if it is determined that each image belonging to the given GOP cannot be generated on a decoding side unless encoded data of the relevant image is used, then it is determined that the relevant image is encoded and the encoded data thereof is output;

[Kimata does not disclose] a GOP encoding/non-encoding data encoding step of encoding GOP encoding/non-encoding data for indicating whether the encoded data of the image belonging to the given GOP is output; and

[Kimtata discloses~does not disclose] an in-GOP image encoding step of encoding the image belonging to the given GOP when the encoded data of the image is output, wherein:

[Kimata does not disclose] when a subject is included in said images belonging to the GOPs and it is determined that the relevant image of the given GOP is not encoded, image data of the subject having a viewing position or direction which corresponds to the given GOP is generated using data of the images belonging to the GOPs other than the given GOP.

The Puri prior art

The Examiner combines Kimata with Puri. The Examiner admits that Puri is not the same field as applicants' invention, and characterizes Puri as being an "analogous field of endeavor." However, regardless of the field of endeavor, Puri does not disclose any of the elements of applicants' claim. Puri relates to video coding with motion-compensated interpolation for CD-ROM applications. Puri discloses a technique called Conditional Motion-Compensated Interpolation (CMCI).

According to Puri, in CMCI (conditional motion-compensated interpolation) the target to be encoded is not MCPE (motion-compensated *prediction* error) but MCIE (motion-compensated *interpolation* error), which is additional information. Puri teaches that MCIE and MCPE are coded independently to allow much finer coding of MCPE as opposed to MCIE. [page 131, second paragraph].

Puri states that the "trick" to doing CMCI "is to keep the additional information as small as possible, sending it only where it is really necessary." [Puri page 131, first

partial paragraph] However, in this context, Puri is referring to how to regenerate skipped frames when performing conditional motion-compensated *interpolation*. A skipped frame is generated by interpolation if those frames are temporally close together; but is generated using the non-interpolated MC coding if those frames are temporally distant.

> "In a CMCI-based coding scheme, MC-coding is exploited to code temporally distant frames while the intermediate ('skipped') frames are coded with CMCI, using the reconstructed neighboring frames. The motion-compensated interpolation error (MCIE) is coded where it is significant. The MCIE and MCPE are coded independently, … unlike the MC-coded frames, the interpolative coded frames do not feed quantization errors back into the predictive-coding loop." [Puri, p. 131, second paragraph]

Perhaps the Examiner believes that Puri's "trick" is applicable in applicants' invention (which applicants do not concede is accurate). However, the Examiner has failed to demonstrate that Puri can read upon any of the elements of applicants' claims. Thus, on its face, Puri when combined with Kimata does not supply the missing elements from Kimata.

Puri teaches a different concept

Not only does Puri fail to satisfy any of applicants' claim elements, Puri actually teaches quite a different concept. In applicants' invention as set forth in claim 1, various determinations are made based on whether a given GOP "can be generated" or "cannot be generated." In Puri, the issue is not whether the interpolated frame can be generated

or not. The issue is whether the interpolated frame will be so near in data size to the MC-coded frame that it makes no sense not to use the MC-coded frame:

> "However, the advantage of motion-compensated interpolation is lost if the amount of information sent for the 'skipped' frames approaches that sent for the MC-coded frames." [Puri, p. 131, first partial paragraph]

Applicants submit that the Examiner has not properly performed the required steps set forth in Graham v. John Deere. The Examiner did not find any of the elements of applicants' claim 1 in the prior art (except arguably the preamble and perhaps the in-GOP image encoding step, which applicants do not concede). At best the Examiner has found a reference (Kimata) that teaches the basic GOP concept (without any of applicants' claimed steps) and a reference (Puri) that teaches conditional encoding in the context of a conditional motion-compensated interpolation scheme (without any of applicants' claimed steps). Thus the Examiner simply has not made out a prima facie case as required by Graham v. John Deere: the examiner has not properly (a) determined the scope of prior art, or (b) ascertained the differences between prior art and applicants' claims.

Lack of Rational Underpinning

Setting aside the errors in ascertaining the differences between the claimed invention and the prior art, the Examiner has also failed to provide any rational underpinning for why one of skill in the art would combine Kimata and Puri to achieve Appellants' invention.

Taking the position that applicants' had previously misunderstood the Examiner's proposed combination of Kimata and Puri, the Examiner explained at page 2 of the Final Office Action the purported rationale behind his position:

> "The interpolation by other GOP's (Chapter 4: inter GOP; Chapter 3 View Generation based on Ray-Space) is already disclosed by Kimata. The proposed examiner's modification only needs incorporation of idea of conditional encoding (Puri's CMCI), not Puri's motion compensated interpolation but interpolation by other GOP's by Kimata. Conditional encoding teaches whether the encoding of the current GOP is encoded or not based on the magnitude of the interpolation error where the interpolation is done by other GOP's only."

Thus it would seem that the Examiner needs to modify not only the teachings of Kimata, but also the teachings of Puri in order to support his theory of obviousness. Puri on its face addresses the issue of whether the interpolated frame will be so near in data size to the MC-coded frame that it makes no sense not to use the MC-coded frame:

> "However, the advantage of motion-compensated interpolation is lost if the amount of information sent for the 'skipped' frames approaches that sent for the MC-coded frames." [Puri, p. 131, first partial paragraph]

Thus Puri monitors interpolation error and then selectively sends *in every case* an interpolated frame or an MC-coded frame. When interpolated frames are sent, Puri teaches that *additional information* is sent along with the interpolated frame, the *additional information* being used to describe motion-induced inaccuracies. [Puri, p. 131, first partial paragraph.] Puri explains that, as the number of inaccuracies grows, the additional information needed to describe these inaccuracies also grows. At some point, it becomes more efficient to forgo using the interpolated frame and switch to encoding a

MC-coded frame, which is what Puri teaches. Puri's goal is "to keep the *additional information* as small as possible, by sending it only where it is really necessary." [Puri, p. 131, first partial paragraph].

Thus in either case, Puri teaches that a frame must be encoded. Selection as to whether an interpolated frame or an MC-coded frame is encoded is performed to minimize the *additional information* required to be sent.

The applicants submit that the examiner, using hindsight, has extracted from this teaching in Puri, the broader idea of *conditional encoding* without regard to what technical feature is used as the *condition* or what is the *result* of such encoding. In the present situation both the condition and the result are quite different as the table below shows.

	Condition	**Result**
Puri	Is temporal distance across "skipped" frames large?	Yes: Encode using MC-coding; No: Encode using interpolative-coding.
Applicant	Can GOP be generated on decoding side without using encoded data?	Yes: Don't output encoded data; No: Do output encoded data.

The reason articulated by the Examiner as to why he believes one of skill in the art would find it obvious to combine Puri with Kimata is as follows:

> "It was obvious that Puri's selective encoding of frame can be applied to a selective encoding of GOP in Kimata since Kimata has GOP based structure (base GOP and Inter-GOP, Chapter 4 and Fig. 7.)
>
> Therefore, given this teaching, it would have been obvious…to modify Kimata by incorporating selectively encoding the each image belonging to the relevant GOP based on the significance of interpolation error with transmission of encoding/non-encoding information (1 bit), in order to keep the additional information as small as possible." [Final Office Action at page 8]

The Examiner's rationale, however, does not follow from the teachings of Puri. Following Puri, as explained by the Examiner above, applicants would presumably (a) output encoded data (using base GOP) if interpolation error is on one side of a threshold; and would (b) output encoded data (using base GOP and Inter-GOP) if interpolation error is on the opposite side of the threshold. This is not what applicants are claiming.

The Examiner has not explained or provided any rational underpinning as to why one of skill in the art would ignore the plain teachings of Puri, as explained by the Examiner above, and instead (a) DO NOT output encoded data if the GOP can be generated on the decoding side and (b) DO output encoded data if the GOP cannot be generated on the decoding side. Applicants submit that what the Examiner is really doing is using his own hindsight to reverse engineer applicants' claimed invention, extract a general principle (selective encoding of something, based on some condition) that can be said of both applicants' invention and the prior art and then finding applicants' invention obvious while ignoring the actual teachings of that prior art reference. Such a reverse-engineered technique is not in keeping with *KSR* which requires a rational underpinning.

1. **The Examiner has failed to establish a prima facie case of obviousness of claims 1-4, 8-11, and 16**

As explained above, the Examiner made two legal errors, resulting in a failure to establish a prima facie case of obviousness. First, the Examiner failed to properly ascertain the differences between the prior art and the claimed invention. Second, the Examiner failed to provide a rational underpinning as to why one of ordinary skill in the art would combine the teachings of Kimata and Puri in the manner suggested by the Examiner. Because the Examiner's analysis was legally flawed in at least these two respects, the Examiner has failed to establish a prima facie case of obviousness under 35 U.S.C. §103, in accordance with *Graham v. John Deere Co.* 383 U.S. 1 (1966) and *KSR International Co. v. Teleflex Inc.* 550 U.S. 398 (2007).

Claim 1 has been discussed in detail above and pertains to the encoding method. Independent claim 8 contains the equivalent limitations but is directed to an encoding apparatus. The same arguments apply to claim 8 as claim 1. In addition, the same arguments apply to all claims dependent upon claims 1 or 8.

In view of the foregoing, Appellants respectfully submit that the Examiner's ruling should be reversed and that claims 1-4, 8-11, and 16 are in condition for allowance for at least the above reasons.

2. **The Examiner has failed to establish a prima facie case of obviousness of claims 5-7, 12 -14 and 18**

Independent method claim 5 and independent apparatus claim 12 are directed to the decoding method and apparatus, thus serving as the decoding counterpart to the encoding method and apparatus of claims 1 and 8, respectively. As discussed in

connection with claim 1, the prior art Kimata and Puri references do not teach or suggest the basic encoding/non-encoding decision made by applicants' encoding system in generating the output. Similarly, Kimata and Puri do not teach the use of such encoding/non-encoding decision in performing decoding. Independent claims 5 and 12 recite this feature, namely:

> "a GOP encoding/non-encoding data decoding step of decoding GOP encoding/non-encoding data for indicating whether the encoded data of each image belonging to a given GOP is to be decoded" (from method claim 5; a comparable recitation is found in apparatus claim 12)

Therefore, for the reasons explained above in connection with independent claim 1, the Kimata and Puri references fail to provide a prima facie basis for rejecting these claims as obvious under 35 U.S.C. § 103.

In view of the foregoing, Appellants respectfully submit that the Examiner's ruling should be reversed and that claims 5-7, 12 -14 and 18 are in condition for allowance for at least the above reasons.

B. Rejection under 35 U.S.C. § 103(a) over Kimata in view of Puri, and further in view of Eifrig (U.S. Pat. No. 5,991,447; "Eifrig")

1. The Examiner has failed to establish a prima facie case of obviousness of claims 2 and 9

Claims 2 and 9 are dependent upon claims 1 and 8, respectively. Thus Appellants' arguments made with respect to the independent claims are applicable here as well and will not be repeated.

In view of applicants' arguments with respect to independent claims 1 and 8, applicants submit that the Examiner has not complied with the requirements of 35

U.S.C. §103 in accordance with *Graham v. John Deere Co.* 383 U.S. 1 (1966) and *KSR International Co. v. Teleflex Inc.* 550 U.S. 398 (2007). Appellants respectfully submit that the Examiner's ruling as to claims 2 and 9 should be reversed and that claims 2 and 9 are in condition for allowance for at least the above reasons.

C. Rejection under first paragraph of 35 U.S.C. § 112

In Applicants' amendment, filed August 17, 2011, in response to a non-final office action, independent claims 1, 5, 8 and 12 were amended to add a "wherein" clause to the end of those claims. As a matter of typing style, the introductory word "wherein" was appended to the preceding line and the remainder of the newly added clause was indented as a new paragraph at the end of the claim. The Examiner took the position that this was adding new matter under the first paragraph of 35 U.S.C. § 112.

As best understood, it appears that the Examiner is construing the "wherein" clause as modifying only the in-GOP encoding step, as opposed to summarizing the method steps of the entire claim. Applicants offered to amend the claim to move the "wherein" word to a new line, so as to deemphasize any impression that the clause only modifies the in-GOP encoding step. The Examiner refused to permit such amendment, stating that it would require further consideration and/or new search.

Applicants' respectfully submit that this boils down to a minor clerical objection, which could have been resolved by simple amendment as proposed. Applicants further submit that this is not an instance where the specification is deficient under 35 U.S.C. § 112, first paragraph. As the Examiner has admitted, the subject matter added by this wherein claim language is found in the specification. In this regard, the Examiner has

made reference to Fig. 2 and pages 13-19 of the specification. Thus applicants submit that the Examiner found ample support in the specification for the wherein clause, and that the Examiner should have entered the proposed minor amendment to resolve any perceived ambiguity.

Should there be any doubt, however, with respect to the substance of the Examiner's rejection under 35 U.S.C. § 112, first paragraph, applicants respectfully identify the additional support in the specification for the disputed claim language. See page 21, lines 6-10:

> "when no encoded data is output from the in-GOP image encoding part 110, the decoded image storage memory 112 deletes the decoded images at times T1 and T2, and stores images corresponding to the encoding data of the GOP which is determined by the GOP encoding determination part 117, among the images generated by the image generation pert 114 (i.e., images generated by the selected image generation method)."

Applicants § 103 arguments do not hinge on the § 112 issue

Applicants also note that their arguments in preceding sections VII A and B, regarding the rejections under 35 U.S.C. § 103, do not hinge on the disputed "wherein" clause. Thus there should be no reason for the Examiner to require a further search in order to evaluate the subject "wherein" clause.

Applicants therefore respectfully submit that the rejection under 35 U.S.C. § 112, first paragraph, should be reversed, with direction to enter the proposed amendment submitted in applicants' December 6, 2011 response.

CONCLUSION

Appellants respectfully request the Board to reverse the Examiner's rejection of the claims on appeal.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 080750 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

HARNESS, DICKEY, & PIERCE, P.L.C.

Dated: February 6, 2012

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VIII. CLAIMS APPENDIX

This is a complete and current listing of the claims.

1. A video encoding method that assigns a plurality of images to a plurality of GOPs which correspond to different viewing positions or directions, and encodes images belonging to the GOPs as a video image, the method comprising:

a GOP encoding determination step in which:

if it is determined that each image belonging to a given GOP can be generated on a decoding side without using encoded data of a relevant image, it is determined that the relevant image is not encoded and no encoded data thereof is output; and

if it is determined that each image belonging to the given GOP cannot be generated on a decoding side unless encoded data of the relevant image is used, then it is determined that the relevant image is encoded and the encoded data thereof is output;

a GOP encoding/non-encoding data encoding step of encoding GOP encoding/non-encoding data for indicating whether the encoded data of the image belonging to the given GOP is output; and

an in-GOP image encoding step of encoding the image belonging to the given GOP when the encoded data of the image is output, wherein:

when a subject is included in said images belonging to the GOPs and it is determined that the relevant image of the given GOP is not encoded, image data of the

subject having a viewing position or direction which corresponds to the given GOP is generated using data of the images belonging to the GOPs other than the given GOP.

2. A video encoding method in accordance with claim 1, wherein:

the GOP encoding determination step includes determining whether an image generated by using one or more other GOPs without decoding the encoded data of the relevant GOP is closer to an original image of the relevant image in comparison with an image obtained by decoding the encoded data, so as to determine whether the image belonging to the relevant GOP is to be encoded.

3. A video encoding method in accordance with claim 1, further comprising:

a generation reference-GOP encoding step of encoding generation reference-GOP designating data for designating one or more other GOPs which are used for generating the image belonging to the relevant GOP when the encoded data of this image is not output.

4. A video encoding method in accordance with claim 1, further comprising:

a generation data encoding step of encoding generation data for designating an image generation method which is used for generating the image belonging to the relevant GOP when the encoded data of this image is not output.

5. A video decoding method that decodes encoded data generated by assigning a plurality of images to a plurality of GOPs which correspond to different

viewing positions or directions, and encoding images belonging to the GOPs as a video image, the method comprising:

a GOP encoding/non-encoding data decoding step of decoding GOP encoding/non-encoding data for indicating whether the encoded data of each image belonging to a given GOP is to be decoded; and

an in-GOP image decoding step in which:

if the GOP encoding/non-encoding data indicates that the encoded data of a relevant image is to be decoded, the relevant image is decoded by decoding the encoded data; and

if the GOP encoding/non-encoding data indicates that the encoded data of the relevant image is not to be decoded, the relevant image is decoded by using an image generation method which does not use the encoded data of this image, wherein:

when a subject is included in said images belonging to the GOPs and the GOP encoding/non-encoding data indicates that the encoded data of the relevant image is not to be decoded, image data of the subject having a viewing position or direction which corresponds to the given GOP is generated using data of the images belonging to the GOPs other than the given GOP.

6. A video decoding method in accordance with claim 5, further comprising:

a generation reference-GOP decoding step of decoding generation reference-GOP designating data for designating one or more other GOPs which are used for generating the image belonging to the relevant GOP when the encoded data of this image is not decoded.

7. A video decoding method in accordance with claim 5, further comprising:

a generation data decoding step of decoding generation data for designating the image generation method which is used for generating the image belonging to the relevant GOP when the encoded data of this image is not decoded.

8. A video encoding apparatus that assigns a plurality of images to a plurality of GOPs which correspond to different viewing positions or directions, and encodes images belonging to the GOPs as a video image, the apparatus comprising:

a GOP encoding determination part in which:

if it is determined that each image belonging to a given GOP can be generated on a decoding side without using encoded data of a relevant image, the GOP encoding determination part determines that the relevant image is not encoded and no encoded data thereof is output; and

if it is determined that each image belonging to the given GOP cannot be generated on a decoding side unless encoded data of the relevant image is used, then the GOP encoding determination part determines that the relevant image is encoded and the encoded data thereof is output;

a GOP encoding/non-encoding data encoding part for encoding GOP encoding/non-encoding data for indicating whether the encoded data of the image belonging to the given GOP is output; and

an in-GOP image encoding part for encoding the image belonging to the given GOP when the encoded data of the image is output, wherein:

when a subject is included in said images belonging to the GOPs and the GOP encoding determination part determines that the relevant image of the given GOP is not encoded, image data of the subject having a viewing position or direction which corresponds to the given GOP is generated using data of the images belonging to the GOPs other than the given GOP.

9. A video encoding apparatus in accordance with claim 8, wherein:

the GOP encoding determination part determines whether an image generated by using one or more other GOPs without decoding the encoded data of the relevant GOP is closer to an original image of the relevant image in comparison with an image obtained by decoding the encoded data, so as to determine whether the image belonging to the relevant GOP is to be encoded.

10. A video encoding apparatus in accordance with claim 8, further comprising:

a generation reference-GOP encoding part for encoding generation reference-GOP designating data for designating one or more other GOPs which are used for generating the image belonging to the relevant GOP when the encoded data of this image is not output.

11. A video encoding apparatus in accordance with claim 8, further comprising:

a generation data encoding part for encoding generation data for designating an image generation method which is used for generating the image belonging to the relevant GOP when the encoded data of this image is not output.

12. A video decoding apparatus that decodes encoded data generated by assigning a plurality of images to a plurality of GOPs which correspond to different viewing positions or directions, and encoding images belonging to the GOPs as a video image, the apparatus comprising:

a GOP encoding/non-encoding data decoding part for decoding GOP encoding/non-encoding data for indicating whether the encoded data of each image belonging to a given GOP is to be decoded; and

an in-GOP image decoding part in which:

if the GOP encoding/non-encoding data indicates that the encoded data of a relevant image is to be decoded, the in-GOP image decoding part decodes the relevant image by decoding the encoded data; and

if the GOP encoding/non-encoding data indicates that the encoded data of the relevant image is not to be decoded, the in-GOP image decoding part decodes the relevant image by using an image generation method which does not use the encoded data of this image, wherein:

when a subject is included in said images belonging to the GOPs and the GOP encoding/non-encoding data indicates that the encoded data of the relevant image is not to be decoded, image data of the subject having a viewing position or direction

which corresponds to the given GOP is generated using data of the images belonging to the GOPs other than the given GOP.

13. A video decoding apparatus in accordance with claim 12, further comprising:

a generation reference-GOP decoding part for decoding generation reference-GOP designating data for designating one or more other GOPs which are used for generating the image belonging to the relevant GOP when the encoded data of this image is not decoded.

14. A video decoding apparatus in accordance with claim 12, further comprising:

a generation data decoding part for decoding generation data for designating the image generation method which is used for generating the image belonging to the relevant GOP when the encoded data of this image is not decoded.

15. (cancelled)

16. A non-transitory computer-readable storage medium storing a video encoding program for making a computer execute a process used for implementing the video encoding method in accordance with claim 1.

17. (cancelled)

18. A non-transitory computer-readable storage medium storing a video decoding program for making a computer execute a process used for implementing the video decoding method in accordance with claim 5.

IX. EVIDENCE APPENDIX

None

X. RELATED PROCEEDINGS APPENDIX

None